



**PLANITOP 18 ES**  
**Very Rapid-Hardening Repair Mortar with Extended Working Time**

**SECTION 03 01 30**  
**MAINTENANCE OF CAST-IN-PLACE CONCRETE**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Products for maintenance of concrete, including the following:
  - 1. Rapid-setting horizontal concrete repair.
  - 2. Corrosion-inhibiting.

**1.2 RELATED SECTIONS**

- A. Section 03 30 00 - Cast-in-Place Concrete.

**1.3 REFERENCES**

- A. ASTM International:
  - 1. ASTM C109 - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens).
  - 2. ASTM C928 - Standard Specification for Packaged, Dry, Rapid-Hardening Cementitious Materials for Concrete Repairs.

**1.4 SUBMITTALS**

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Verification Samples: For each finish product specified, two samples, minimum size 6" (150 mm) square representing actual product, color and patterns.

**1.5 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Minimum 5 years' experience manufacturing similar products.
- B. Installer Qualifications: Minimum 2 years' experience installing similar products.
- C. Source Limitations: For repair products, obtain each color, grade, finish, type and variety of product from single source and from single manufacturer with resources to provide products of consistent quality in appearance and physical properties.
- D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - 1. Finish areas designated by Architect.
  - 2. Do not proceed with remaining work until workmanship is approved by Architect.



3. Refinish mock-up area as required to produce acceptable work.

## 1.6 PRE-INSTALLATION MEETINGS

- A. Convene at least two weeks prior to starting work of this section.

## 1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
- B. Handling: Handle materials to avoid damage.

## 1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

## 1.9 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

# PART 2 PRODUCTS

## 2.1 MANUFACTURERS

- A. Product Performance:

Compressive strength – ASTM C109 (CAN/CSA-A5)

3 hours	> 3,000 psi (20.7 MPa)
1 day	> 5,000 psi (34.5 MPa)
7 days	> 5,500 psi (37.9 MPa)
28 days	> 7,000 psi (48.3 MPa)

Compressive strength – ASTM C39

28 days	> 6,000 psi (41.4 MPa)
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Flexural strength – ASTM C348 (CAN/CSA-A23.2-8C)

28 days	> 1,000 psi (6.9 MPa)
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Consistency – ASTM C109

5 minutes	≥ 100%
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Slant/shear bond strength – ASTM C882 (modified)

1 day	> 1,800 psi (12.4 MPa)
7 days	> 2,500 psi (17.2 MPa)

Length change – ASTM C157 (modified C928)

28 days, air-cured	≥ - 0.15%
28 days, water-cured	≥ +0.15%



Splitting tensile strength – ASTM C496

1 day > 400 psi (2.76 MPa)  
28 days > 600 psi (4.14 MPa)

Freeze/thaw resistance – ASTM C666-A (CAN/CSA A23.2-9B)

300 cycles > 98%

Rapid chloride permeability – ASTM C1202 (AASHTO T277)

28 days < 1,000 coulombs

B. Acceptable Manufacturer:

MAPEI North America

1144 E. Newport Center Dr.; Deerfield Beach, FL 33442

Toll-Free for CRS Technical Services: Tel. 888-365-0614

Email: [CRS@mapei.com](mailto:CRS@mapei.com)

Web: [www.mapei.com](http://www.mapei.com)

C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

D. Substitutions: Not permitted.

## 2.2 RAPID-SETTING HORIZONTAL CONCRETE REPAIR PRODUCTS

A. One-Component, Extended-Set, High-Early-Strengthening, Horizontal Cementitious Repair Mortar Suitable for Sloped Conditions: Packaged, dry mix for repair of concrete.

1. Product: Subject to compliance with requirements, provide MAPEI Corporation; Planitop 18 ES.
2. Product shall comply with ASTM C928/C 928MR3.
3. Compressive Strength: Not less than 3,000 psi (21.0 MPa) within three hours when tested according to ASTM C109

## 2.3 MISCELLANEOUS MATERIALS

A. Portland Cement: ASTM C150, Type I, II or III unless otherwise indicated.

B. Water: Potable.

## 2.4 MIXES

A. General: Mix products in clean containers according to manufacturer's written instructions.

1. Do not add water, thinners or additives unless recommended by manufacturer.
2. When practical, use manufacturer's premeasured packages to ensure that materials are mixed in proper proportions. When premeasured packages are not used, measure ingredients using graduated measuring containers; do not estimate quantities or use shovels or trowels as units of measure.
3. Do not mix more materials than can be used within time limits recommended by manufacturer. Discard materials that have begun to set.

B. Mortar Scrub Coat: Mix dry ingredients with enough water to provide consistency of thick cream.

C. Dry-Pack Mortar: Mix required type(s) of patching-mortar dry ingredients with just enough liquid to form damp cohesive mixture that can be squeezed by hand into a ball but is not plastic.



- D. Concrete: Comply with Section 03 30 00 - Cast-in-Place Concrete.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Properly prepared concrete at least 28 days old, stable, sound and dry.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### **3.2 PREPARATION**

- A. Concrete surface must be free of loose particles, efflorescence, paints, tars, grease, asphaltic materials, bond breakers, curing compounds, wax, and dry foreign substances or any conditions that may affect product performance or proper bonding.
- B. Mechanically profile and prepare concrete surfaces by engineer-approved methods in accordance with the most current ICRI 310.2R Guidelines concrete surface profile (CSP) #5 or greater.
- C. Ensure that all exposed reinforcing steel is prepared in accordance with the most current ICRI 310.1 guideline and coated with either Planibond 3C or Mapefer 1K.

### **3.3 MIXING**

- A. Before product use, take appropriate safety precautions. Refer to the Safety Data Sheet for details. Into a clean mixing container, pour 2.75 U.S. qts. (2.60 L) of cool, clean, potable water, not to exceed 2.88 U.S. qts. (2.73 L) per 50-lb. (22.7-kg) bag to achieve the desired consistency.
- B. Use a rotary drum mixer to mechanically mix the material. Pre-dampen the mixer and remove excess water before proceeding. Alternatively, use a heavy-duty, low-speed drill (at 400 to 600 rpm) and an appropriate paddle.
- C. For an extended mix, add up to 50% by weight (25 lbs. [11.3 kg]) of clean, washed, saturated surface-dry (SSD), 3/8" (10 mm) pea gravel per 50-lb. (22.7-kg) bag.
- D. Avoid overmixing, or moving the mixer up and down during the mixing process, as it could shorten the pot life.
- E. Mix only the amount of material that can be applied within 30 minutes.

### **3.4 INSTALLATION**

Read all installation instructions thoroughly before installation.

- A. Ensure that the prepared concrete is SSD before application of Planitop 18 ES.



B. Use a float or screed to install Planitop 18 ES to a thickness no more than 1" (2.5 cm) neat per lift or up to 6" (15 cm) extended.

C. Place Planitop 18 ES within the established pot life, which is about 30 minutes at 73°F (23°C). Application times will vary depending on climatic conditions.

### 3.5 CURING

A. Keep Planitop 18 ES protected from high winds and direct sunlight while it cures.

B. Planitop 18 ES must be cured for at least 4 hours with burlap and polyethylene, a fine mist of water or an appropriate ASTM C309 – referenced curing compound.

### 3.6 PROTECTION

A. Protect installed products until completion of project.

B. Touch up, repair or replace damaged products before substantial completion.

END OF SECTION